

Index of Signs and Symptoms

Presented in this chapter are lists of pesticides reported to have caused particular symptoms and signs, or combinations thereof, in poisoned individuals. The lists may help direct the attention of health professionals to possible toxic causes of the various disease manifestations, prompting inquiry into likelihood of exposure to the listed chemicals. If certain agents appear suspect, inquiry can then be made into the presence of additional manifestations typical of poisoning by those substances.

The limitations of this approach to diagnosis must be understood. First, all manifestations of illness have multiple causes, pesticidal and nonpesticidal. Second, there are no specific symptoms or signs that are invariably present in poisonings by particular pesticides. Third, many poisonings are characterized by unexpected manifestations.

Finally, neither route of exposure nor dosage of pesticide is taken into account in this listing. For example, effects of high-dose ingestion are not distinguished from effects of relatively low-dose dermal absorption, nor are topical effects distinguished from systemic dermal manifestations. The lists of pesticides can only be regarded as *clues* to prompt further inquiry by the interviewing professional.

The term manifestation means either symptom or sign. The word “poisoning” is used loosely in these headings to include topical as well as systemic effects. Pesticides which are relatively consistent in causing particular manifestations are listed in the middle column, headed “Characteristic of These Agents.” Pesticides that have caused various conditions with less consistency, or are less prominent features of poisoning, are listed in the right-hand column, headed “Occurs with These Agents.” Obviously, the distinction is not clear-cut.

Some symptoms (malaise, fatigue, dizziness) occur so commonly in poisoned individuals that they have little or no value in differential diagnosis, and are therefore not included in these tables.

General

MANIFESTATION	CHARACTERISTIC OF THESE AGENTS	OCCURS WITH THESE AGENTS
Rotten egg odor	Sulfur	
Hypothermia	Creosote Norbormide	
Hyperthermia (fever, pyrexia)	Nitrophenols Pentachlorophenol	Borate Thallium Metaldehyde Inorganic arsenicals Chlorophenoxy compounds Cadmium dusts Naphthalene
Chills	Phosphine Arsine	
Hot sensations	Nitrophenols Chlordimeform	Pentachlorophenol
Myalgia	Paraquat Chlorophenoxy compounds	
Thirst	Pentachlorophenol Nitrophenols Inorganic arsenicals Phosphorus Phosphides Sodium fluoride Cholecalciferol Aminopyridine	Borate Endothall
Anorexia	Organophosphates Carbamate insecticides Nicotine Pentachlorophenol Hexachlorobenzene Chlordimeform Cholecalciferol	Halocarbon fumigants Nitrophenols Inorganic arsenicals Aminopyridine
Alcohol intolerance	Thiram Calcium cyanamide	
Sweet taste in the mouth	Chlordimeform	
Metallic taste in the mouth	Inorganic arsenicals Organic mercury	
Salty, soapy taste In the mouth	Sodium fluoride	

Skin

MANIFESTATION	CHARACTERISTIC OF THESE POISONINGS	OCCURS WITH THESE AGENTS
Irritation, Rash, Blistering, or Erosion (without sensitization)	Copper, organotin, cadmium compounds Metam sodium Paraquat Diquat Sodium chlorate Phosphorus Sulfur Glyphosate Propargite Sodium hypochlorite Quaternary ammonia Thiram Chlordimeform Cationic detergents Hexachlorophene Ethylene oxide Formaldehyde Acrolein Methyl bromide Ethylene dibromide Dibromochloropropane Dichloropropane Endothall Aliphatic acids	Pentachlorophenol Picloram Chlorophenoxy compounds Captan Rotenone Diethyltoluamide Creosote Fungicides Herbicides with irritant properties Petroleum distillate
Contact dermatitis	PCP Paraquat DEET Chlorhexidine Creosote Hexachlorophene Pyrethrins Chlorothalonil Thiram Thiophthalimides	
Flushing	Cyanamide Nitrophenols	Thiram plus alcohol
Dermal sensitization	Propachlor Propargite Ethylene oxide	Anflazine Chlorothalonil Barban Captafol Formaldehyde
Beefy red palms, soles	Borate	
Urticaria	Chlorhexidine PCP DEET	Fluoride Pentachlorophenol
Bullae	Liquid fumigants	Hexachlorobenzene

Skin (continued)

MANIFESTATION	CHARACTERISTIC OF THESE POISONINGS	OCCURS WITH THESE AGENTS
Pallor	Organochlorines Fumigants Sodium fluoride Creosote	Coumarins Indandiones
Cyanosis	Sodium chlorate Paraquat Cadmium dusts Sodium fluoroacetate Strychnine Crimidine Nicotine Organochlorines	Organophosphates Carbamate insecticides Agents that cause shock, myocardiopathy, severe arrhythmias or convulsions
Yellow stain	Nitrophenols	
Keratoses, brown discoloration	Inorganic arsenicals	
Ecchymoses	Coumarins Indandiones	Phosphorus Phosphides
Jaundice	Carbon tetrachloride Chloroform Phosphorus Phosphides Phosphine Paraquat Sodium chlorate	Inorganic arsenicals Diquat Copper compounds
Excessive hair growth		Hexachlorobenzene
Loss of hair	Thallium	Inorganic arsenicals
Loss of fingernails		Paraquat Inorganic arsenicals
Brittle nails, white striations		Inorganic arsenicals Thallium
Sweating, diaphoresis	Organophosphates Carbamate insecticides Nicotine Pentachlorophenol Naphthalene Aminopyridine	Copper compounds

Eye

MANIFESTATION	CHARACTERISTIC OF THESE POISONINGS	OCCURS WITH THESE AGENTS
Conjunctivitis (irritation of mucous membranes, tearing)	Copper compounds Organotin compounds Cadmium compounds Metam sodium Paraquat Diquat Acrolein Chloropicrin Sulfur dioxide Naphthalene Formaldehyde Ethylene oxide Methyl bromide Endothall Toluene Xylene	Thiophthalimides Thiram Thiocarbamates Pentachlorophenol Chlorophenoxy compounds Chlorothalonil Picloram Creosote Aliphatic acids
Tearing	Organophosphates Carbamate insecticides Chloropicrin Acrolein	Pentachlorophenol Pyrethrins
Yellow sclerae	Nitrophenols	Agents that cause jaundice (see above under Skin)
Keratitis	Paraquat	
Ptosis	Thallium	
Diplopia	Organophosphates Carbamate insecticides Nicotine	
Photophobia		Organotin compounds
Constricted visual fields	Organic mercury	
Optic atrophy		Thallium
Miosis	Organophosphates Carbamate insecticides	Nicotine (early)
Dilated pupils	Cyanide Fluoride	
Unreactive pupils	Cyanide	

Nervous System

MANIFESTATION	CHARACTERISTIC OF THESE POISONINGS	OCCURS WITH THESE AGENTS
Paresthesia (chiefly facial, transitory)	Organophosphates Cyanopyrethroids Phosphides Organochlorines Thiabendazole	Nicotine (late)
Paresthesia of extremities	Inorganic arsenicals Organic mercury Sodium fluoroacetate Carbon disulfide Thallium	Pyrethroids (transitory)
Headache	Organophosphates Carbamate insecticides Nicotine Inorganic arsenicals Organic mercury Cadmium compounds Organotin compounds Copper compounds Thallium Fluoride Borates Naphthalene Phosphine Halocarbon fumigants Creosote Diquat Cholecalciferol Cyanamide	Organochlorines Nitrophenols Thiram Pentachlorophenol Paraquat Diethyltoluamide
Behavioral – mood Disturbances (confusion, excitement, mania, disorientation, emotional lability)	Organic mercury Inorganic arsenicals Organotin compounds Thallium Nicotine Sodium fluoroacetate Diquat Cyanide Nitrophenols Aminopyridine Carbon disulfide Methyl bromide	Organophosphates Carbamate insecticides Pentachlorophenol Sodium fluoride Diethyltoluamide Organochlorines
Depression, stupor, coma, respiratory failure, often without convulsions	Organophosphates Carbamate insecticides Sodium fluoride Borate Diquat	Inorganic arsenicals Metaldehyde Sulfuryl fluoride Halocarbon fumigants Phosphorus Phosphine Paraquat Chlorophenoxy compounds Diethyltoluamide Alkyl phthalates

Nervous System (continued)

MANIFESTATION	CHARACTERISTIC OF THESE POISONINGS	OCCURS WITH THESE AGENTS
Seizures/Convulsions (clonic-tonic) sometimes leading to coma	Organochlorines Strychnine Crimidine Sodium fluoroacetate Nicotine Cyanide Acrylonitrile Metaldehyde Thallium DEET Chlorobenzilate Carbon disulfide Phosphine Povidone-iodine Hexachlorophene Sodium chlorate Creosote Endothall Fluoride	Nitrophenols Pentachlorophenol Inorganic arsenicals Organotin compounds Diquat Borate Sulfuryl fluoride Methyl bromide Chlorophenoxy compounds Organophosphates Carbamate insecticides Aminopyridine
Muscle twitching	Organophosphates Carbamate insecticides Nicotine Sulfuryl fluoride	Organic mercury Chlorophenoxy compounds
Myotonia		Chlorophenoxy compounds
Tetany, carpopedal spasms	Fluoride Phosphides Phosphorus	
Tremor	Organic mercury Thallium Organophosphates Carbamate insecticides Nicotine Metaldehyde Borates	Pentachlorophenol Nitrophenole Thiram
Incoordination (including ataxia)	Halocarbon fumigants Organophosphates Carbamate insecticides Carbon disulfide Nicotine Thallium	Organic mercury Organochlorines
Paralysis Paresis, muscle weakness	Inorganic arsenicals Organophosphates Carbamate insecticides Nicotine	Organic mercury Diethyltoluamide
Hearing loss	Organic mercury	

Nervous System (continued)

MANIFESTATION	CHARACTERISTIC OF THESE POISONINGS	OCCURS WITH THESE AGENTS
Hypotension shock	Phosphorus Phosphides Phosphine Sodium fluoride Sodium chlorate Borate Thallium Copper compounds Endothall Cyanamide	Inorganic arsenicals Nicotine (late) Creosote Alkyl phthalate Cycloheximide Formaldehyde Norbormide
Hypertension	Thallium (early) Nicotine (early)	Organophosphates

Cardiovascular System

MANIFESTATION	CHARACTERISTIC OF THESE POISONINGS	OCCURS WITH THESE AGENTS
Cardiac arrhythmias	Sodium fluoroacetate Halocarbon fumigants Nicotine Sodium fluoride Ethylene oxide Sodium chlorate Thallium-ventricular Povidone-iodine Veratrum alkaloid (sabadilla)	Inorganic arsenicals Phosphorus Phosphides Phosphine Organochlorines Cyanide Acrylonitrile Fluoride
Bradycardia (sometimes to asystole)	Cyanide Organophosphates Carbamate insecticides	Nicotine
Tachycardia	Nitrophenols Pentachlorophenol Cyanamide	Metalddehyde Organophosphates

Respiratory System

MANIFESTATION	CHARACTERISTIC OF THESE POISONINGS	OCCURS WITH THESE AGENTS
Upper respiratory tract irritation, rhinitis, scratchy throat, cough	Naphthalene Paraquat Chloropicrin Acrolein Dichloropropene Ethylene dibromide Sulfur dioxide Sulfuryl fluoride Acrylonitrile Formaldehyde Cadmium dusts ANTU	Dry formulation of copper, tin, zinc compounds Dusts of thiocarbamate and other organic pesticides Chlorophenoxy compounds Aliphatic acids Rotenone
Sneezing	Sabadilla	
Runny nose	Pyrethrins Inorganic arsenicals Organophosphates Carbamate insecticides	Dry formulation of copper, tin, zinc compounds Dusts of thiocarbamate and other organic pesticides Chlorophenoxy compounds Aliphatic acids Rotenone
Pulmonary edema (many chemicals come packaged in a hydrocarbon vehicle, well known to cause pulmonary edema)	Methyl bromide Phosphine Phosphorus Phosphine Ethylene oxide Ethylene dibromide Acrolein Pyrethroids Sulfur dioxide Cationic detergents Creosote Methylisothiocyanate Cadmium	Organophosphates Carbamate insecticides Paraquat Phosphides
Pulmonary consolidation	Paraquat Cadmium dusts Methyl bromide	Diquat
Dyspnea	Organophosphates Carbamate insecticides Nicotine Paraquat ANTU Cadmium dusts Cyanamide Sulfuryl fluoride Pentachlorophenol Methyl bromide Sulfur dioxide Chloropicrin	Nitrophenols Cyanide Creosote Pyrethrins

Gastrointestinal Tract and Liver

MANIFESTATION	CHARACTERISTIC OF THESE POISONINGS	OCCURS WITH THESE AGENTS
Nausea, vomiting, commonly followed by diarrhea	Organophosphates Carbamate insecticides Nicotine Arsenicals Fluoride Cadmium compounds Organotin compounds Copper compounds Sodium chlorate Borate Cyanide Chlorophenoxy compounds Phosphorus Phosphides Phosphine Carbon disulfide Chloropicrin Halocarbon fumigants Endothall Metaldehyde Thallium Red quill Diquat Naphthalene Methyl bromide Dibromochloropropane Veratrum alkaloid Thiram	Pentachlorophenol <i>B. thuringiensis</i> Cholecalciferol Thiram Ethylene dichloride Propane Ethylene oxide Cresol Many pesticides have some irritant property
Diarrhea (first)	Organophosphates Carbamates Pyrethroids Borates Sulfur Nicotine <i>B. thuringiensis</i> Thiram Cadmium	Cationic detergents Cresol Hexachlorophene Chlorophenoxy compounds
Diarrhea (bloody)	Fluoride Paraquat Diquat Thallium Coumarins Indandiones Endothall Arsenicals	Phosphorus Phosphides Cycloheximide

Gastrointestinal Tract and Liver (continued)

MANIFESTATION	CHARACTERISTIC OF THESE POISONINGS	OCCURS WITH THESE AGENTS
Abdominal pain	Organophosphates Carbamate insecticides Paraquat Diquat Nicotine Methaldehyde Fluoride Borate Phosphorous Phosphides Inorganic arsenicals Cadmium compounds Copper compounds Thallium Organotin compounds	Chlorophenoxy compounds Aliphatic acids Sodium chlorate Creosote Endothall Aminopyridine Coumarins Indandiones Fumigants (ingested) Cycloheximide
Stomatitis	Inorganic arsenicals Paraquat Diquat Copper compounds	Thallium
Salivation	Organophosphates Carbamate insecticides Nicotine Aminopyridine Sodium fluoride Cyanide Cadmium compounds	
Ileus	Thallium Diquat	

Liver

MANIFESTATION	CHARACTERISTIC OF THESE POISONINGS	OCCURS WITH THESE AGENTS
Enlargement	Copper compounds Sodium chlorate Phosphine Carbon tetrachloride Cholorform	Inorganic arsenicals Hexachlorobenzene
Jaundice – see section on Skin		

Kidney

MANIFESTATION	CHARACTERISTIC OF THESE POISONINGS	OCCURS WITH THESE AGENTS
Proteinuria Hematuria Sometimes leading to oliguria Acute renal failure with azotemia	Inorganic arsenicals Copper compounds Sodium fluoride Naphthalene Borate Nitrophenols Pentachlorophenol Sodium chlorate Sulfuryl fluoride Paraquat Diquat Arsine Ethylene dibromide	Cadmium compounds Phosphorus Phosphides Phosphine Chlorophenoxy compounds Creosote Organotin compounds
Dysuria, hematuria, pyuria	Chlordimeform	
Polyuria	Cholecalciferol	Fluoride
Hemoglobinuria	Naphthalene Sodium chlorate Arsine	
Wine-red urine (porphyrinuria)	Hexachlorobenzene	
Smoky urine	Creosote	
Glycosuria		Organotin compounds
Ketonuria		Borate

Reproductive System

MANIFESTATION	CHARACTERISTIC OF THESE POISONINGS	OCCURS WITH THESE AGENTS
Low sperm count	Dibromochloropropane	Kepone

Blood

MANIFESTATION	CHARACTERISTIC OF THESE POISONINGS	OCCURS WITH THESE AGENTS
Hemolysis	Naphthalene Sodium chlorate Arsine	Copper compounds Cresol
Methemoglobinemia	Sodium chlorate Creosote	Chlordimeform Cyanide Cresol Copper Arsine
Hypoprothrombinemia	Coumarins Indandiones	Phosphorus Phosphides Carbon tetrachloride
Hyperkalemia	Sodium chlorate Naphthalene Arsine	Sodium fluoride
Hypocalcemia	Fluoride	Thallium Phosphorus Phosphides
Hypercalcemia	Cholecalciferol	
Carboxyhemoglobinemia		Organotin compounds
Anemia	Naphthalene Sodium chlorate Arsine Inorganic arsenicals	
Leukopenia, Thrombocytopenia	Inorganic arsenicals	
Elevated LDH GOT, GPT, alkaline phosphatase, ALT, AST enzymes	Carbon tetrachloride Chloroform Phosphine	Inorganic arsenicals Phosphorus Phosphides Phosphine Sodium chlorate Nitrophenols Pentachlorophenol Thallium Organochlorines Chlorophenoxy compounds
Depressed RBC Acetylcholinesterase and plasma pseudocholinesterase	Organosphosphates	Carbamate insecticides